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May 13, 1993

Secretary
Federal Communications Commission
1919 M. Street, N.W.
Washington, D.C. 20554

RE: RM-8218

Dear Sir:

I enclose herewith for filing an original and four copies of supplemental comments by The American Digital Radio Society.

Yours truly,

Warren J. Sinsheimer

Enclosures

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of Part 97 of the Rules	)	
Governing the Amateur Radio	)	**RM-8218**
Services Concerning High-Frequency	)	
Data Communications	)	

To: The Commission

SUPPLEMENTAL COMMENTS

The American Digital Radio Society
c/o Warren J. Sinsheimer
30 Rockefeller Plaza
New York, NY 10112

May 13, 1993

The American Digital Radio Society ("Society") filed comments with respect to the American Radio Relay League ("ARRL") petition for Rule Making 8218 on May 12, 1993.

After the Society had served a copy of its comments on the ARRL as required by the Federal Communications Commission rules, a preliminary report to the ARRL's Board of Directors was issued by the ARRL committee on amateur radio digital communications. The Society believes that it is important for the Commission to have this report formally before it when it considers the ARRL petition.

A copy of the report is annexed hereto as A.

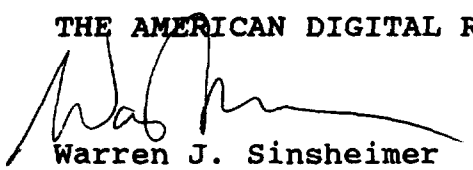
In summary, the report recommends that unattended HF semi-automatic operations be permitted outside of the sub-bands suggested by the ARRL petition but such operation should not emit signals greater than 500 hz in bandwidth. The report recommends that the ARRL petition be modified to permit such unattended semi-automatic operations outside of the subbands.

The Society does not actively oppose the creation of the sub-bands and the Society does approve of unattended semi-automation operation anywhere in the HF bands where digital communications are permitted. Further, the Society believes that the bandwidth of digital operations outside of subbands should be limited to 500 hz. Consequently, the Society urges the Commission to consider favorably the

recommendation of the ARRL Committee on Amateur Radio Digital Communications dated March 28, 1993 whether or not the Board of the ARRL adopts them.

Respectfully submitted,

THE AMERICAN DIGITAL RADIO SOCIETY



Warren J. Sinsheimer

CERTIFICATE OF SERVICE

I, Marcia Hoyes, do hereby certify that I served a copy of the within comments on the American Radio Relay League by depositing a copy thereof in a post box maintained by the U.S. Postal Service at 30 Rockefeller Plaza, New York, NY 10112. The same was addressed to:

Christopher D. Imlay, General Counsel
Booth, Freret & Imlay
1233 20th Street, N.W.
Suite 204
Washington, D.C. 20036

Marcia Hoyes

Dated: May 13, 1993

ANNEX A

Preliminary Report to the ARRL Board of Directors

by the

ARRL Committee on Amateur Radio Digital Communications

March 28, 1993

INTRODUCTION

At the January 1993 meeting the ARRL Board of Directors directed this Committee to further study the issue of how to accommodate unattended semi-automatic operation in the HF amateur bands. At the same time the Board directed the ARRL staff to submit a petition to the FCC requesting rule making that would authorize unattended semi- and fully-automatic operation in specific HF subbands.

PREVIOUS RECOMMENDATIONS

While this Committee recommended unattended fully-automatic operation in certain HF subbands it did not contemplate that such subbands would be the only authorization for unattended operation. The Committee believes that crowding all forms of unattended operation into such a limited spectrum would render the subbands useless for all operations whether they be Packet, AMTOR, Clover, Pactor, or RTTY. In addition, crowding all modes into these sub-bands would stifle the development of new technology.

CONCERNS REGARDING SEMI-AUTOMATIC OPERATION

The Committee understands the Board's concern regarding unlimited unattended semi-automatic operation and offers the suggestions below for reducing the risk of excessive spectrum use. To provide additional protection against abuse of unattended privileges, the Committee suggests the following recommendations be considered by the ARRL Board of Directors.

1. Unattended HF semi-automatic stations, operating outside of the subbands designated for unattended fully-automatic stations, shall not emit signals greater that 500 Hz in bandwidth (as defined in Subpart 47CFR97.3(a)(8).

This, in effect, more than triples the effective use of spectrum compared to wide-band modes such as 300 baud HF Packet.

2. The ARRL develop, through the Digital Committee and the

digital community, guidelines and standards for semi-automatic digital stations to maximize the efficiency of message relay systems and minimize the unnecessary use of HF spectrum.

3. Beaconing by unattended semi-automatic stations should be illegal.

In addition, the Committee would like to draw the Board's attention to an important aspect of semi-automatic operation as defined in its June 1992 recommendation: No semi-automatic station will transmit a signal unless that transmission is initiated by a human operator. That operator has the responsibility (as has long been amateur practice) to avoid interference with others. It has been argued that since there is not an operator at both ends of a path that it is not possible to be absolutely sure that no interference will occur.

Unlike voice or CW operation where there can be long one-way transmissions, current digital modes (with the exception of RTTY) continuously transmit signals from both ends of a link which very greatly improves the probability of an operator observing any activity on the frequency. While it is not perfect, it's not seriously flawed either. The likelihood of interference is not seriously greater than from a purely manually operated station causing interference when attempting a contact.

SUMMARY

Through the use of 500 Hz narrow band modes, the elimination of beaconing, and the standardization of operating guidelines for all automatic stations, the committee feels amateurs not interested in message relay systems will be provided the protection contemplated by the ARRL Board of Directors at the July 1992 annual meeting. The Committee recommends that the petition be modified to include the use of semi-automatic message relay systems as discussed in previous recommendations, but with the additional protection of the use of a bandwidth not to exceed 500 Hz.

A more lengthy discussion of the issues is found in the attached appendix.

APPENDIX

compromise the existing HF Packet network until such time those operators move to the newer technologies.

PROTECTIONS

In light of the above considerations, the committee will recommend that the ARRL petition the FCC to permit unattended semi-automatic operation outside of the petition sub-bands, but that the following be considered in order to ensure compatibility with amateurs who are not interested in message relay systems:

1. Unattended, semi-automatic stations operating outside of the sub-bands should not be permitted to use a mode exceeding 500 Hz in bandwidth. The newer technologies

The Committee is, therefore, recommending that existing 300 baud Packet or other wideband systems not be allowed to operate unattended outside the proposed automatic-control subbands, but that narrowband modes be permitted to operate in semi-automatic mode in the manner proposed in the Committee's June, 1992 report.
(Note: this does not preclude the Packet community from developing more "friendly" systems to use for semi-automatic operation--at consequently lower risk to other users.) Note particularly that the proposed use of unattended stations outside of the proposed automatic-control subbands would absolutely prohibit undirected transmissions (beacons) or initiation of communications by the unattended station.

OPERATING GUIDELINES

The Committee believes that the advent of semi-automatic operation would require a commitment from the Committee and the League to promulgate semi-automatic operating

transmitted bandwidths and the high degree of susceptibility to adjacent-channel interference is one reason why existing Packet-forwarding channels are spaced 2 kHz apart). Narrowband digital stations can be experiencing 10- to 20-dB signal-to-interference ratios from Packet stations on nearby frequencies--under which conditions throughput of the narrowband link will be excellent--while those same Packet stations are suffering debilitating interference from the narrowband operations. The inevitable result of putting existing Packet stations and narrowband stations in the same restricted subband will be that the narrowband stations "take over" the frequencies -- not from any malicious intent on the part of the narrowband stations, but merely because they are unable to detect the interference they cause to Packet stations making use of excessively wide receiver filters.

The automatic-control subband widths recommended by the Committee in the September 26, 1992 report to the Board were selected based on the assumption that semi-automatic operation would occur largely outside those subbands. It was not then and is not now the opinion of this Committee that all desirable unattended operations can coexist in the proposed subbands. Packet will be adversely affected by any attempt to do so.

The Committee recognizes that one desirable result of the crowding of automatic stations will be the pressure to develop more spectrum-efficient technologies. The Committee favors the introduction of spectrally-efficient technologies. But the disruption to automatic-forwarding Packet networks that would result from implementation of only the automatic control subbands would be immediate, near-total, and long-lasting. "Immediate" because a large number of APLINK and other computerized narrowband message relay stations would move to the automatic control subbands--which are already largely filled with Packet stations on 2-kHz channels--to take advantage of the improved service they could provide when removed from the local-control requirement. "Near total" for the technical reasons outlined above. "Long lasting" because there is not presently available a replacement for Packet in fully-automatic service.

The last point requires expansion. The unique characteristic of Packet that makes it suitable for fully automatic operation is its channel-sharing ability. Stations that initiate communications must be able to detect other users of the frequency (at least, other users of their own kind) and automatically act cooperatively to share the frequency. Other digital modes rely only on the initiating operator to perform this service, either by "ear" or by noting that the link activities indicate that the unattended station is receiving interference. Packet does this

detection automatically. Therefore, existing and proposed fully automatic stations cannot abandon Packet until some replacement technology arises that addresses both the channel-sharing and spectral-efficiency issues.

It can be argued that controlled networks could provide fully automatic service without automatic frequency sharing with proper management. Aside from the additional administrative burden imposed on such networks by the lack of automatic sharing techniques, such an approach would severely limit flexibility. For example, a small, fully automatic network testing new technology would likely not find a place to operate as all existing channels are filled with message-handling stations. But if automatic channel sharing is available, as in Packet, adding stations to the frequency--even stations not participating in the same network--is simple, resulting merely in slightly lower throughput for the other stations on frequency. Lack of automatic channel sharing makes it much more difficult to accommodate such changes in network makeup.

MAXIMIZING "ENFRANCHISEMENT"

The Committee has as one of its guiding principles that no amateur be denied access to our common spectrum. Indeed, ensuring to the extent possible that all amateurs--digital operators and non-digital operators alike--have spectrum

MAXIMIZING "THROUGHPUT"

Proper use of the available spectrum also calls for maximizing the amount of information that flows. The measure of this efficiency can be expressed broadly in bits-per-second-per-Hertz. That is, getting the maximum information rate in the minimum bandwidth. The Committee is vitally interested in assisting the amateur community to advance digital technology in that direction. It is the view of the Committee that a technology that provides 1) spectral efficiency, 2) robustness, and 3) automatic channel sharing, is highly desirable. Such a technology would better serve all digital applications, automatic, semi-automatic and manual alike, by allowing all amateurs to participate in the various digital applications, while making good use of the available spectrum.

SUMMARY

The Committee believes that the recommendations that have been developed, including the modifications encompassed in this report, provide for the necessary protection of all amateurs, a nurturing environment for the development of new technologies, the vehicle to encourage efficient use of HF spectrum, and the support necessary to properly manage the growth in traffic handled by digital networks.